

# NEW MOVEMENT OF PROVINCIAL UNIVERSITIES UNDER THE CONCEPT OF REGIONAL DEVELOPMENT SCHEME IN CHINA

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**ABSTRACT :** This paper studies the economic development situation of eastern, central, and western regions in China, and the functions of Chinese universities, which include education, research and contribution to the society. A new Chinese innovation system has been emerging in forms of university-run enterprise. The commitment of Chinese government to further introduction of a market economy has been elaborated with a focus on the relations between university and industry. A new regional development scheme by using of the functions of university is considered as the effective strategy to promote economic development of China in this stage.

*Key words : Regional Development, Functions of University, University-run Enterprise*

## 1. INTRODUCTION

Shortly after the founding of People's Republic of China, Chinese government took education as a matter of primary importance, and made enhancing cultural quality of people as basis of the construction of China. Since the initiation of the reform and opening policies in 1978, along with the dismantling of the planned economy system and the deepening of the reform of the economic system, commodity, capital, labor service and technology markets have appeared one after the other in China. Now China has transformed its planned economy system into an initial socialist market economy system. As a result, the regulatory function of the market has been strengthened tremendously. At the same time, China has carried out strategy of rejuvenating the nation by relying on science and education and put education on strategic position with priority development, marked by the restoration of the higher education examination system. With more than 20 years' development, China has attained considerable achievements attracting worldwide attention in education and got on the road to accelerated development.

As China looks to sustain the past success of economic growth in 21<sup>st</sup> century, it needs to make major changes in its development strategy in order to fulfill its national development targets. This paper focus on the regional disparity resulted by rapid economic development in China, the role of the university in a national innovation system and the linkages between university and the society, which give driving force to regional economic development of China by using of the functions of university.

## 2. ECONOMIC DEVELOPMENT

Over the past two decades, China's GDP has kept an annual growth rate of about 8% on average. Together with the increased industrial labor productivity, the living standard of Chinese people has increased at about 7% each year in constant price.

There are 22 provinces, 4 municipalities directly administered by central government, 5 autonomous regions in inland China. Since 1986, China has made a classification of its regions into eastern, central and western region, which are at different stages of development. The eastern region covers 12 provinces such as Beijing, Shanghai and Guangdong province. This region accounts for about 14% of China's land mass and 40% of its population. It has easy access to transportation, a dense population and started up at an early date in economic development. It is also rich in high-quality human resources. The central and western regions include 19 provinces. It accounts for 86% of China's land mass and 60% of its population. In contrast to the eastern coastal region, the central and western regions are relatively backward in infrastructure such as transportation and telecommunications.

In short, the strategy of developing the coastal region was effective, and as a consequence of development of the coastal region, the gap between that region and the central and western regions of the country widened. The economic gaps among different regions represent a potential obstacle to future economic growth in China. Therefore, it is the right time for China to find its way to balance the economic development of each region.

### 3. UNIVERSITY-RUN ENTERPRISE

University-run enterprise refers to those enterprises or firms, which are being owned or controlled by the universities they are affiliated with. Many of these enterprises were created by funds from universities and many universities are still the largest shareholders in these companies.

University-run enterprises came into being since 1950s in China. Particularly those engineering and science-based universities have had university-affiliated factories, which are mainly used for students to get short-term internship or apprenticeship in a real production environment. Also under the ‘self-sufficient organizational system’ for enterprises, universities, and other social institutions after the founding of the People’s Republic of China, many universities had its own service providers such as print shops, publishers, guesthouses, and so forth.

The development of university-run enterprises is from early 1980s to 1990s. During this period of time, China just began to implement its reform and open door policy, which includes encouraging the educational institutions to engage in the economic and social development. Faced with the commercial opportunities in the society and their internal financial need, the traditional university-affiliated service providers began to open up to the general society while many new services were also created. Most of their operations were focused on technology transfer, technology development, technology consulting, and technology service. In the year of 2000, there were 5451 university-run enterprises in China and several dozen of them are already listed on the stock markets. They are being run under three models. The first one is university-affiliated factories or print shops. The second model is to bring university technologies to create joint commercial entities with enterprises outside universities. The third model is companies or firms of technology development created by universities and departments [Table 1].

**Table 1.** Category of Chinese University-run Enterprises (Year 2000)

Category Items		Ratio (%)
Type of Business	Manufacture	36.6
	Trade & Related Service	15.6
	Others	47.8
Type of Ownership	University-owned	87.9
	Joint Ventures with Domestic Partners	10.2
	Joint Ventures with Foreign Partners	1.9
Type of Management Control	Belong to University	77.4
	Belong to School, Department or Institute	22.6

### 4. FUNCTIONS OF UNIVERSITY

Economic globalization, market forces, administrative decentralization, and information technology have extended the autonomy of social organizations, including educational institutions. New challenges have developed at every level of the education system. In the past, university had only primary task of higher education to college students, academic research became another important function later. In recent years, university has its third function of serving society and promoting economic development with the spring up of modern knowledge economy. A multi-level and multi-format education system comprehending all disciplines has taken initial shape to fit in with national economic and social development. It basically made 9 years compulsory primary education and the reform in education management system made breakthrough progress. With the continuous deepening of the reform of organizations of higher education, the scale of ordinary institutions of higher education has been greatly developed, and the benefits remarkably enhanced [Figure 1].

Universities play an increasingly important role in the transformation of Chinese society towards a knowledge-based economy. Both public research institutes and universities have increasingly been promoted to stimulate the economic development of the country. The first incubator, which is one of the forms of Chinese university-run enterprise, emerged in 1987 in Wuhan, the national high-tech development zone – Beijing New-tech Development Trial Zone, which functioned as the predecessor of Zhongguancun Science Park was also launched by the government during this period of institutional reforms. The total area of the Zongguancun Science Park contains 39 member universities. The number of employees is now over 200,000 and still increasing rapidly. According to the statistics of 1998, there were 173,000 employees, of whom 7.6% had obtained Ph.D. and Master’s degrees, 35.7% Bachelor’s degrees, and another 22.0% had graduated from junior colleges and technical secondary schools. The whole enterprise is deeply rooted into the scientific community by deliberate policies. Of the 383 members of the Scientific Board, 300 are based on the Academy of Science and the Academy of Engineers, that is, they are among the top-level scientists and engineers of the country. The development of the Zongguancun Science Park, which integrates five existing science parks in Beijing is a recent development. The “high-tech development zones” are constructed on the basis of principles similar to the “free zones”, which were functional in opening the Chinese economy during the first half of the 1990s. Fifty-three “high-tech development zones” have now been established throughout the country. Like the Zongguancun Science Park, they can count on government support in order to solve problems at the interfaces between the economic forces of the market, legislation, and knowledge input. The Chinese government has chosen the role of making the political system supportive of the introduction of a market economy and a knowledge-based society.

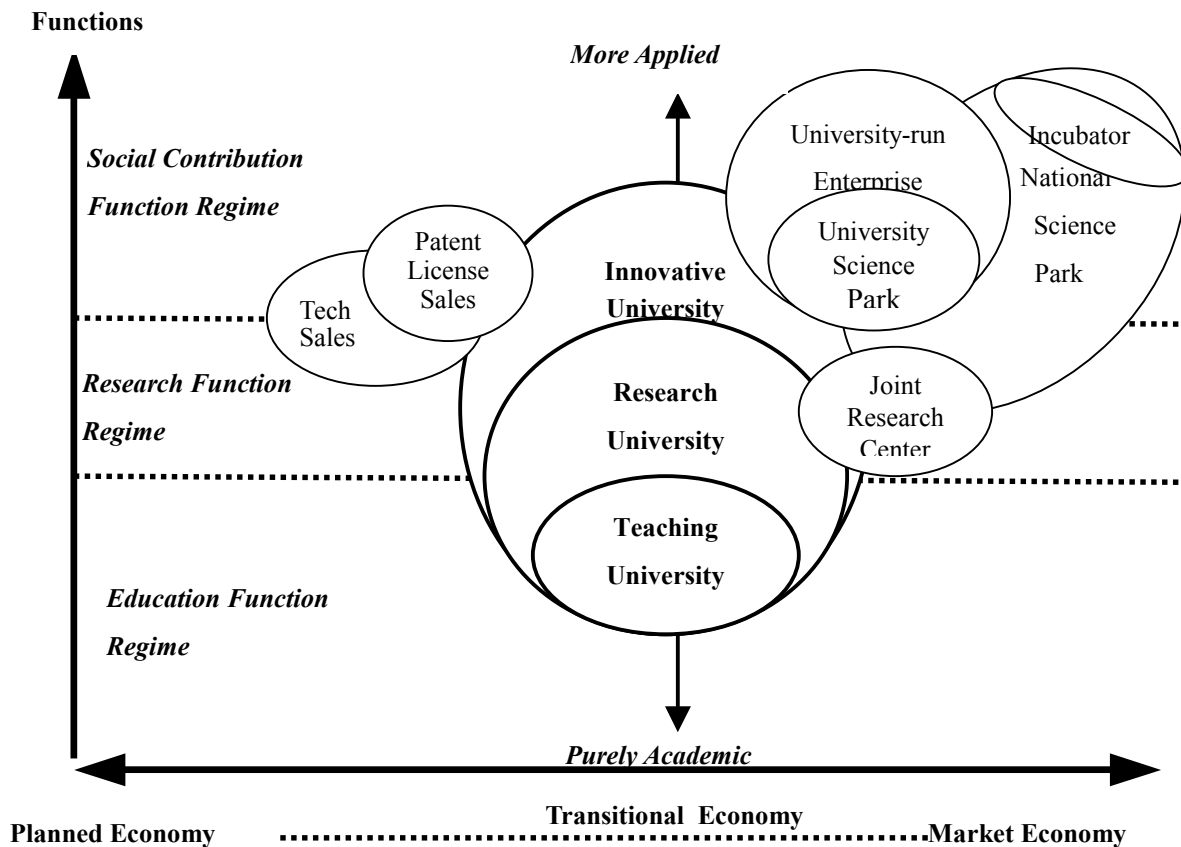


Figure 1. Functions of Chinese University

## 5. REGIONAL DEVELOPMENT SCHEME

In recent years, the rise of knowledge economy has led to the recognition of the essential role that technological innovation has played in economic development. In such transitional stage the network of regional development by using of the functions of university needs the mutual collaboration among university, industry, research institute, other organizations in society and government. The core of this task is that fulfilling close integration of education, science, technology, economy and politics. The functions of university in today's economic development of China need policy support of promotion, macro planning, guide and harmonization from local and central governments. In this new configuration, academia can play a role as a source of firm-formation, technological development, in addition to its traditional role as a provider of basic knowledge.

The changes in the position of the university in a knowledge-based regime require an ongoing process of rethinking their functions at the strategic level in terms of evolving university-run enterprise. Therefore, the functions of university in today's regional economic development of China can be summarized as innovation base for combination between universities and industries, driving force for mutual development of organizations and cradle for human resources.

### 5.1 Contribution to Technology Innovation

The main obstacles for transferring technology to outside manufacturing firms were (1) weak absorptive capacity of manufacturing firms. (2) under development of the related institutions such as information service agency, patent licensing office, intellectual property right protection. In other words, the universities' confidence in their own internal resources come from the high market transaction cost, which is mainly due to the weak absorptive capacity and underdeveloped institution, in addition to their own unique assets which outside firms did not have.

The transfer of technology from university to industry is not the simple process of technology exchange, but it is the process of technology innovation on the basis of introduced technology. This process needs support of human resources who are from university both teachers and students. University-run enterprises give employment priority to college graduates, these graduates are not only the backbones of industries, but also the ligament between industry and university. Industry can realize the trends of advanced science & technology, the newest idea, production and method of university through the close relations that has already been set up with university. Industry can make good use of them to having innovation idea; setting up innovation task after combining them with the information comes from

market feedback. Industry can also consign university to do certain research, then assign employees to involve in it or carry out it by establishing one research center cooperated with university. Industry can exploit it by inviting college teachers and students to work as their part-time jobs. During this process of two-way intervention, industry fulfills innovations according to the requirement of market competition, and university technology transfers to industry step by step, which can be turned into productivity at last. University acquires necessary information from the feedback of industrial manufacture and market so that it can increase the research level and promote the close link between technology and market. Therefore the two-way technology innovation chain between university and industry comes into being.

## 5.2 Contribution to Mutual Development

Universities have resources such as technologies, brand, human capital, network, and they have to choose whether to internalize the resources by starting university-run enterprises or externalize them by transferring the resources to the manufacturing firms. Given this situation, the Chinese universities have decided to make their own firms because they were highly motivated to make money by the reform of S&T system in 1985, which drastically cut down the government fiscal support for academic institutions, and because they felt they were more competent in industrializing knowledge than the outside manufacturing firms. Therefore, comparative advantages of parent universities, strong engineering research and talented faculty and students, are an important source of strength for the university-run enterprises. Academic strengths and reputation are other important contributors to the strong growth of university-run enterprises.

The operation of university-run enterprise attracts other social organizations such as finance, law, consultation inevitably. It provides beneficial environment and condition for the existence and development of industries by giving birth to coherence power of macro-economy as the result of mutual relations and mutual effects among these organizations. Innovation production of university-run enterprise diffuses outside or searches for cooperation partners and production base. This kind of coherence power, attraction power and diffusion power force University Science Park making relationship with local high-tech development zones and nearby industrial zones so that it gives opportunity for regional development. Under certain circumstances, the university can take the role of industry, helping to form new firms in incubator facilities. Government can take the role of industry, helping to support these new developments through funding programs and regulations. Industry can take the role of the university in developing training and research, often at the same high level with university. The network relationships are changing the participating institutions into relatively autonomous yet interdependent spheres.

## 5.3 Contribution to Education Reform

Although university-run enterprises have an abundant educated workforce, creative personnel are lacking in certain fields because the educational system in China does not much emphasize creative thinking and problem-solving skills. The reform fields of Chinese higher education system include the overall operation mechanism. In the new market economy, it is the market demand and supply, play the fundamental role in resource allocation and utilization. In such a system, higher education institutions need to gear their programs to meet the human resource needs of the labor market. Restructure Chinese higher education system through mergers of universities or setting up collaborative arrangement among higher education institutions by breaking the departmentalized boundaries of different ministries. Therefore, most of universities belong to local governments, not central ministries, and universities got much more freedom in their management system than before [Table 2]. Curriculum reform is coupled with the reform in teaching and learning process, which marked a shift of emphasis from the memorization of factual knowledge to the cultivation of students' ability in creative and critical thinking problem solving and information acquisition and generation, and intellectual independence. Such kind of higher education reform in China is still on the way.

University-run enterprises are taking on the task of students' study practice as well as promoting economic development, which becomes one of the essential parts of education system. It is beneficial for improving students' ability of applying book theory into practice, reform of major and subjects, and enrichment of teaching contents because there is increasing demand in society for qualified college graduate students who are not only good at book theory, but also good in practical field. Human resource should have the capacity of innovative thinking, study ability, practice experience and strong dedication energy. The whole process should obey to market rules because such functions of university can brought into play in market economy.

**Table 2.** Category of Chinese Higher Education Institutions (Year: 2004)

University Funding University Type	University Funded by State			Funded by Society
	Central Ministry-owned		Province -owned	
	Ministry of Education	Other Ministries		
Regular Institutions of Higher Learning	73	23	1587	197
Adult Institutions of Higher Learning	548			2

## 6. CONCLUSION

Regional economy is a very complex system. The traditional theory of regional economy could not keep pace with the rapid development of contemporary regional economy. With the continuing improvement of scientific technology, the functions of knowledge resources and knowledge assets have shaken the traditional theory of regional economy, which is based not only on natural resources but also on invention or market. Even so, it is not likely that the disparity will disappear altogether because the eastern region will continue to develop on the foundations already laid, the priority will be to control the disparity, keeping it from widening, so that it will not threaten political stability.

There are historical institutional rationales that fostered the emergence and evolution of these university-run enterprises over the past two decades. They have made significant contribution to the growth of China's high-tech industry. The operation mechanism of Chinese university-run enterprise has special characteristics, which are government support, relying on university, market mechanism, and industry movement. To summarize, government appropriation for Chinese universities has been far from adequate over a long period of time. Research funding from industry has become a major source of income for universities. Given that research funding from industry accounts for almost half of the total research income, university naturally encourages its faculty to develop closer ties with industry, or even to become entrepreneurs themselves. In addition, the endorsement of the central government and the fact that university-run enterprises have become a priority of university administration also played important roles. In fact, university-run enterprises have much stronger links with their academic mother institutions than ordinary spin-off firms. They use the mother institutions' resources exclusively or at least in very preferential terms compared with other firms. These factors may help to explain why university-run enterprises have become so popular in China but not in other developing countries.

Generally speaking, the process of the economic reform in China is following the route of giving guide to market mechanisms. Socialist market economy is characterized by the guiding principle that under the state's macro-control, public ownership is dominant and diversified economic element are allowed to develop to enable the market to play a fundamental role in resource allocation and distribution. When the market deals inadequately with matters of income distribution and protection of natural resources and the environment, the government's macro-controls must be strengthened. The cross century period is an important phase in China's economic and social development. Giving priority to the development of education is the basis of the two major national strategies of improving the quality of people and rejuvenating the nation by relying on science and education and realizing sustained development. As human society enters the knowledge and information age, it gives driving force to regional economic development of China by using of the functions of university.

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